Changes in the 2002 National Electrical Code

The NEC has many changes this code cycle. Some are editorial, while others are technical changes. Some of the technical changes will have a major impact on the electrical industry.

The editorial changes include new articles, relocated articles, and renumbered articles. You will also find that the NEC now has many of its exceptions converted into positive language. The NEC also now lists the metric unit first and then lists the foot-pound measurement in parenthesis. As shown by the following example:
7.5 m (25 ft).

The NEC no longer uses small letters and hyphens. It now uses a dot in place of a hyphen and capital letters instead of small letters, shown as follows.

Prior to the 2002 NEC - 210-8(a)(1)

New for the 2002 NEC - 210.8(A)(1)

The following list of code changes is new for the 2002 National Electrical Code. This list is not intended to be an all-inclusive list, but hopefully it will give some insight to the changes in the 2002 NEC.

New Articles

ARTICLE 285 Transient Voltage Surge Suppressors: TVSSs

ARTICLE 406 Receptacles, Cord Connectors, and Attachment Plugs (Caps)

ARTICLE 647 Sensitive Electronic Equipment

ARTICLE 692 Fuel Cell Systems

Renumbered and Relocated Articles

Article 312 Cabinets, Cutout Boxes, and Meter Sockets (Page 161)

This used to be Article 373.

Article 380 Switches

Has been renumbered to Article 404 and relocated to Chapter 4.

Article 384 Switchboards and Panelboards

Has been renumbered to Article 408 and relocated to Chapter 4.

Article 305 Temporary Wiring

Has been renumbered to Article 527 and relocated to Chapter 5. It is no longer titled "Temporary Wiring" but rather "Temporary Installations".

Technical Changes

Article 90 (Page 29)

90.9 Measuring Units (Page 31)

Code now places emphasis on the metric system. Foot-pound units are now listed in parenthesis.

Article 100 (Page 33)

Luminaire – Lighting fixtures are now called "luminaires" .

Several other definitions have been revised.

Article 110 (Page 40)

110.16 (Page 42)

The code now requires that a label be field-installed, warning of the potential of arc flash hazards. This must be performed only at locations other than dwelling units.

110.26(C)(2) (Page 44)

Where electrical equipment rooms have equipment rated 1200 amps or more and over 1.8 m (6 ft.) wide, personnel doors must open out and be equipped with panic hardware.

110.26(D) (Page 44)

This section now specifically states that you may use a lamp plugged into a receptacle outlet as permitted by 210.70(A)(1). This would only apply for dwelling units.

110.26(F) (Page 44)

This section has been revised to clarify that any foreign systems cannot be installed in the "dedicated electrical space".

Article 200 (Page 49)

200.6(A) (Page 49)

The word "natural" has been deleted from this text in order to clear up any confusion about the term 'natural gray." (See the fine print note)

Article 210 (Page 51)

210.7(A) (Page 53)

The requirements for 'replacement of receptacles" has been removed from this section and relocated to Article 406.

210.8(A)(5) (Page 53)

There is a new "Exception No. 3" which allows a receptacle supplying only a permanently installed fire alarm or burglar alarm to be exempt from having GFCI protection.

210.8(A)(8) (Page 53)

GFCI protection for boathouse receptacles has been relocated in Article 210.

210.8(B)(3) (Page 53)

The NEC now requires all 125 volt, 15- and 20-amperere receptacles located in kitchens in "other than dwelling units" to have GFCI protection.

210.12 (Page 54)

The NEC now requires arc-fault protection on all branch circuits supplying 125 volt, 15- and 20-amperere outlets installed in dwelling unit bedrooms. (This would include closet lights and smoke alarms.)

210.52(C)(5) (Page 58)

The NEC allows receptacle outlets to be located above countertops but not more than 500 mm (20 in.) above the countertop.

The NEC also now recognizes "appliance garages". Any receptacle that is located in it is not considered to be a required countertop receptacle.

210.63 (Page 59)

The NEC now requires a 125-volt, 15- or 20-ampere rated receptacle outlet to be installed on the same level and within 7.5 m (25 feet) of heating, air-conditioning, or refrigeration equipment.

210.70(A)(2) (Page 59)

The NEC now requires a switch, at dwelling units, for each landing level that includes an entryway, to control the lighting outlets where the stairway between floor levels has six risers or more.

210.71 State Amendment

210.71 Single- and Multiple-station smoke alarms. Listed single- and multiple-station smoke alarms shall be installed in accordance with the provisions of this code and the household fire warning equipment provisions of NFPA 72.

(A) Where required. Single- or multiple-station smoke alarms shall be installed in the locations described in Sections 2l0.71(A)(1) through 210.71(A)(5).

(1) Group R-1. Single- or multiple-station smoke alarms shall be installed and maintained in all the following locations in Group R-1:

a. In sleeping areas.
b. In every room in the path of the means of egress from the sleeping area to the door leading from the guestroom or suite.
c. In each story within the guestroom or suite, including basements. For guestrooms or suites with split-levels and without an intervening door between adjacent levels, a smoke alarm installed on the upper level shall suffice for the adjacent lower level provided that the lower level is less than one full story below the upper level.

Groups R-2, R-3, -R-4 and I-1. Single- or multiple-station smoke alarms shall be installed and maintained in Groups R-2, R-3, R-4, and I-1, regardless of occupant load at all the following locations:

a. On the ceiling or wall outside of each separate sleeping area in the immediate vicinity of bedrooms.
b. In each room used for sleeping purposes.
c. In each story within a dwelling unit, including basements and cellars but not including crawl spaces and uninhabitable attics. In dwellings or dwelling units with split-levels and without an intervening door between the adjacent levels, a smoke alarm installed on the upper level
shall suffice for the adjacent lower level provided that the lower level is less than one full story below the upper level.

(3) Group I-1 Single- or multiple-station smoke alarms shall be installed and maintained in sleeping areas in occupancies in Group I-I. Single- or multiple-station smoke alarms shall not be required where the building is equipped throughout with an automatic fire detection system in accordance with Section 907.2.6 of Volume I, General Construction.

(4) One- and Two-Family Dwellings. Single- or multiple-station smoke alarms shall not be required where the dwelling unit is protected by an approved smoke detection system in accordance with NFPA 72.

(5) Additions, alterations or repairs to Group R. Where an addition, alteration or repair to an individual dwelling unit or guestroom in Group R requires a permit*, smoke alarms shall be installed within that individual dwelling unit or guestroom in accordance with this section. Where one or more sleeping rooms are added or created in an existing Group R, smoke alarms shall be installed in accordance with this section.

*** This is only when a building permit is required.**

Exception: Repairs to the exterior surfaces of occupancies in Group R are exempt from the requirements of this section.

(B) Power source. In new construction, required smoke alarms shall receive their primary power from the building wiring where such wiring is served from a commercial source and shall be equipped with a battery backup. Smoke alarms shall emit a signal when the batteries are low. Wiring shall be permanent and without a disconnecting switch other than as required for overcurrent protection.

Exceptions:
1. Smoke alarms are not required to be equipped with battery backup in Group R-1 where they are connected to an emergency electrical system.
2. Smoke alarms are permitted to be solely battery operated in existing buildings, buildings not served from a commercial power source and in existing areas where alterations or repairs regulated by Section 210. 71(A)(5) do not result in the removal of interior wall or ceiling finishes exposing the structure.

(C) Interconnection. Where more than one smoke alarm is required to be installed within an individual dwelling unit in Group R-2, R-3, or R-4, or within an individual guestroom or suite in Group R-1, the smoke alarms shall be interconnected in such a manner that the activation of one alarm will activate all the alarms in the individual unit. The alarm shall be clearly audible in all bedrooms over background noise levels with all intervening doors closed.

Exceptions:
1. Smoke alarms that are permitted to be solely battery operated in accordance with Section 210.71(B) are not required to be interconnected.
2. Smoke alarms in existing areas are not required to be interconnected where alterations or repairs regulated by Section 210. 71(A)(5) do not result in the removal of interior wall or ceiling finishes exposing the structure.

(D) Acceptance testing. When the installation of the alarm devices is complete, each detector and interconnecting wiring for multiple-station alarm devices shall be tested in accordance with the household fire warning equipment provisions of NFPA 72.

Article 225 (Page 69)

225.32 Exception No. 1 (Page 73)

This exception has been revised to require qualified individuals where documented safe switching procedures are permitted.

225.60 (Page 75)

225.60 and Table 225.60 is new for the 2002 NEC. This addresses conductor clearances over 600 volts crossing over roadways, walkways, rail, water, and open land.

225.61 (Page 75)

225.60 and Table 225.60 is new for the 2002 NEC. This addresses conductor clearances over buildings and other structures.

Article 230 (Page 75)

230.6(4) (Page 76)

This new part allows conductors installed in a conduit and under not less than 450 mm (18 in.) of earth beneath a building or other structure to be considered outside the building or structure.

230.50(3) (Page 79)

If PVC conduit is used in this installation it must be Schedule 80.

Article 240 (Page 85)

240.2 (Page 85)

Definitions used throughout Article 240 have all been placed into this one location.

240.83(D) (Page 93)

The code now requires circuit breakers being used as switches in 120 and 277 volt high-intensity discharge lighting circuits to be listed and marked as HID.

Article 250 (Page 95)

250.2 (Page 95)

Three new definitions have been added and defined to this code section.

250.22(4) (Page 99)

This new code section now addresses language that was previously in 411.5(A) only. Low voltage lighting systems (secondary circuits) are not to be grounded.

250.30(A)(2)(3) (Page 101)

The code now allows taps to be made to the grounding electrode conductor from a separately derived system, in a building where effectively grounded building steel is not present. Instead of running the grounding electrode conductor for each separately derived system to the metal water pipe an individual could have one grounding electrode conductor sized large enough and connect multiple taps from each separately derived system to it.

250.30(A)(5) (Page 102)

The code now specifically states how to size the equipment bonding jumpers between the source of the separately derived system and the equipment containing the first overcurrent device.

250.30(A)(6) (Page 102)

The code states how to size the minimum size grounded conductor for a separately derived system.

250.32(B)(2) (Page 103)

By this revision, the code clarifies the rules on sizing the grounded conductors used for grounding at a separate building.

250.86Exception No. 3 (Page 108)

The code now allows a metal elbow to be installed in a run of non-metallic conduit without being bonded if it encased in at least 2 inches of concrete, while being used for other than a service raceway.

250.92 (Page 108)

The code requires an auxiliary gutter to be bonded where it is part of the electrical service.

250.104(Page 110)

The word ‘interior” has been deleted from this section thereby requiring metal piping to be bonded whether inside or outside.

250.122(B) (Page 114)

The code now requires in this section that anytime an ungrounded conductor is increased in size that equipment-grounding conductors must be increased proportionately.

250.146(A) (Page 117)

The code now allows in this section a receptacle that is surface mounted and has metal-to-metal contact to be considered grounded by this method.

Article 285 (Page 122)

285.1 (Page 123)

This is a new code Article.

Article 300 (Page 123)

300.1(C) (Page 123)

Table 300.1(C) Metric. Designator and Trade sizes. Can use this to convert from metric systems to foot pounds unit when needed.

300.7(A) (Page 127)

The code has added a requirement that where condensation is known to be a problem passing from the interior to the exterior such as in a raceway that it be sealed to prevent this from occurring.

300.11(C) (Page 128)

The code strictly prohibits cable-wiring methods from being used to support for other cables, raceways, or non-electrical equipment.

Article 310 (Page 133)

310.7(D) (Page 135)

The code requires conductors and cables used where exposed to direct rays of the sun to be a type listed for sunlight resistant or listed and marked sunlight resistant.

Article 314 (Page 164)

314.27 (Page 169)

The requirement for lighting fixtures to not be over 16 inches in any dimension has been deleted from this requirement, when a lighting fixture is attached to it.

Article 320 (Page 173)

320.30 (Page 174)

The code now allows up to six feet of Type AC cable to be installed without support form its last point of support.

Article 330 (Page 179)

330.30 (Page 180)

The code now allows up to six feet of Type MC cable to be installed without support form its last point of support.

Article 334 (Page 182)

334.10 (Page 182)

The code now allows the use of non-metallic sheathed cable in dwelling units above three floors if they are Types III, IV, or V construction.

334.10 (Page 182)

The code now also allows the use of non-metallic sheathed cable in other than dwelling units, if Types III, IV, or V construction. However for use in this case, code section 334.12 must be complied with.

334.17 (Page 183)

The code now requires grommets used as required by 300.4 to be listed for the purpose.

334.30 (Page 184)

The code now allows the use of non-metallic cable up to 41/2 feet from the last point of support to where before it only allowed it to be installed from an outlet box without support.

Article 362 (Page 202)

362.10 Exception (Page 202)

The code now allows Electrical Non-metallic Tubing to be installed in buildings above three floors if these buildings have a sprinkler system installed in accordance with NFPA-13-1999, on all floors.

362.10(5) Exception (Page 203)

The code now allows Electrical Non-metallic Tubing to be installed above a suspended ceiling that has a sprinkler system installed in accordance with NFPA-13-1999.

Article 404 (Page 244)

404.8(B) (Page 245)

The code now includes receptacles in this requirement where the voltage may be greater than 300 volts between them and any switches, or similar devices.

404.9(B) (Page 245)

The code has added dimmers to this list of electrical devices that must be grounded.

404.14(E) (Page 247)

The code now prohibits general-use dimmer switches for use other than controlling permanently installed incandescent luminaries (lighting fixtures). Any use other than this, they must be listed and installed accordingly.

404.15(B) (Page 247)

The code requires a switching device with a marked "off" position to completely disconnect all ungrounded conductors to the load it controls.

Article 406 (Page 247)

406.3(A)(B)(C) (Page 247)

This material used to be located in Article 210. Part D addresses replacement receptacles.

406.8(B)(1)(Page 249)

The code now requires receptacles installed outdoors in a wet location to have an enclosure that is weatherproof whether the attachment plug cap is inserted or not.

Article 408 (Page 250)

408.21 (Page 253)

This is specific language that prohibits more than one grounded conductor from being installed in a single terminal.

Article 410 (Page 254)

410.1 (Page 254)

The code is introducing us to a new term, "luminaries" (lighting fixtures).

410.18 (Page 257)

The rule for grounding luminaries (lighting fixtures) has an exception that allows for compliance with 250.130(C) in grounding a metal fixture.

Article 424 (Page 274)

424.44(G) (Page 274)

The code now requires GFCI protection for personnel for electrically heated floors in bathrooms, and in hydromassage, bathtub, spa, and hot tubs locations.

Article 430 (Page 274)

430.32 (Page 292)

Old 430-34 has been relocated into 430.32(C). This section addresses the maximum size overload protection.

430.52 (Page 292)

Old Table 430-152 34 has been relocated into 430.52. This section addresses the maximum rating or setting of motor branch-circuit short-circuit and ground-fault protective device.

430.102(B) (Page 304)

The code now requires a disconnecting means for a motor. In the past the disconnecting means for the controller was allowed to serve as a disconnecting means for the motor if it could be locked in the "off" position.

Article 440 (Page 312)

440.65 (Page 318)

The code now requires single phase cord-and-plug connected room air conditioners to be installed with factory installed LCDI or AFCI protection.

Article 500 (Page 339)

500.2 (Page 339)

Definitions used in this article have been relocated to this code section.

Article 511 (Page 380)

511.3(B)(2) (Page 381)

The code now addresses vehicles that use compressed natural gas in the classified locations of commercial garages.

Article 514 (Page 385)

This article now has a new title "Motor Fuel Dispensing Facilities." There are more types of fuel now other than just gasoline, therefore the code had to address these new types.

Article 527 (Page 429)

527.3(B) (Page 429)

The word "Christmas" has been changed to "holiday decorative lighting". The rules will now cover all holidays.

Article 680 (Page 523)

680.2 (Page 523)

This code section is for definitions of terms used in this article, which use to be located in 680-4. There are some new definitions listed in this section.

680.8(C) (Page 526)

This code section is new and provides guidance for minimum clearances for clearance Network-Powered Broadband Communications.

680.22(A)(4) (Page 527)

This is a new code section that was added to address receptacle location near pools where the area is too small for the normal spacing.

The requirement in past codes has been that a general use receptacle be located between 10-20 feet of the inside wall of a pool.

With this new code section if we are limited by space then a general use receptacle could be located at a minimum distance of 5 feet from the inside wall of the pool.

680.23(E) (Page 529)

This is a new section added to cover the rules for a “Through Wall Lighting Assembly.”

680.26(B) (Page 531)

This code section requires even where a double insulated water-pump motor is being used, that you must still run a solid No. 8 copper conductor to make a connection to a replacement motor if needed.